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EXAMINER	
BONANTO, GEORGE P	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/827,220	Applicant(s) SHAW ET AL.	
	Examiner George P. Bonanto	Art Unit 2855	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-38 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-38 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 19 April 2004 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 19 April 2004.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

Claim 12 is objected to because of the following informalities: claim 12 contains the phrase, "includes one of a thermo-plastic material or a thermoset material." The word "or" is inappropriate and should be deleted. The Examiner suggests the phrase should be replaced with the phrase, "includes at least one of a thermo-plastic material and a thermo set material." Appropriate correction is required.

Claim 18 is objected to because of the following informalities: the last line of claim 18 refers to the second sample rate and the first sample rate. It appears, however, that the second transmitting rate and the first transmitting rate were intended. Appropriate correction is required.

Claim 25 is objected to because of the following informalities: claim 25 contains the phrase, "coupled to the output of piezoelectric sensor." The phrase should be deleted and the phrase, "coupled to the output of the piezoelectric sensor" should be inserted in its place. Appropriate correction is required.

Claim 38 is objected to because of the following informalities: claim 38 contains the phrase, "the output of the comparator." The claim element "the output of the comparator" lacks antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 14-17, 19, 20, 30, 32 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 5,663,496 to Handfield et al.

As to claim 1, Handfield et al. disclose a method comprising operating a tire pressure monitoring system in a first operating mode (system off, or system in power saving mode; col. 11, line 35 to col. 12 line 2) using a piezoelectric sensor to sense vibration (piezo-electric element; col. 11, lines 35-38) determining that an output signal of the piezoelectric sensor is above a predetermined threshold (active only when vehicle velocity is above a certain threshold; col. 11, lines 39-41) and setting the tire pressure monitoring system to a second operating mode based upon the determination that an output signal of the piezoelectric sensor is above a predetermined threshold (on or normal mode when vehicle speed above certain threshold; col. 11 lines 35-41).

As to claim 2, Handfield et al. further disclose that during the first operating mode, an output of a first sensor is sampled at a first sample rate and during the second operating mode the output of the first sensor is sampled at a second sample rate (col. 11, line 35 to col. 12, line 2).

As to claim 3, Handfield et al. further disclose that the first sample rate is slower than the second sample rate (col. 11, line 66 to col. 12, line 2).

As to claim 4, Handfield et al. further disclose that the first sensor is a tire pressure sensor (pressure sensor 32; Fig. 2).

As to claim 5, Handfield et al. further disclose that the first sensor is a temperature sensor (temperature sensor 34; Fig. 2).

As to claim 6, Handfield et al. further disclose that the piezoelectric sensor senses random vibration caused by a wheel rotating over a surface (col. 11, lines 35-38).

As to claim 14, Handfield et al. further disclose that the tire pressure monitoring system is implemented in a motorized vehicle (col. 1ine 16).

As to claim 15, Handfield et al. further disclose transmitting information to a controller system of the motorized vehicle at a first rate during the first operating mode and transmitting information to the controller system at a second rate during the second operating mode, the second rate being higher than the first rate (pressure data transmitted from detector/transmitter to receiver/user interface at periodic intervals; col. 11, lines 11-14 and during power saving mode transmitter is activated less frequently; col. 11, lines 66-67).

As to claim 16, Handfield et al. disclose a tire pressure monitoring system comprising a first sensor having an output for providing an indication of a sensed condition of a wheel (pressure sensor 32 or temperature sensor 34; col. 6, lines 47-48 and Fig. 2) a motion detection system, the motion detection system provides a motion indication indicative of wheel rotation (power signal from battery eliminator indicates wheel motion; col. 12, lines 9-19) the motion indication is utilized for placement of the tire pressure monitoring system in a first operating mode or a second operating mode (system either on or off or in power saving mode; col. 11, lines 38-41 and lines 61-66) wherein the motion detection system further comprises a piezoelectric sensor for sensing vibration of a wheel rotating over a surface (col. 12, lines 9-16) the piezoelectric sensor having an output to provide an output signal indicative of an amplitude of the sensed vibration (signal from bridge rectifier; col. 12, lines 16-19) wherein the motion

detection system utilizes the output signal in providing the motion indication (col. 11, line 35 to col. 12, line 2).

As to claim 17, Handfield et al. further disclose that the tire pressure monitoring system further comprises a controller that samples an indication of the sensed condition as sensed by the first sensor at a first rate during the first operating mode (system off, or system in power saving mode, col. 11, lines 38-41 and 64-66) samples an indication of the sensed condition as sensed by the first sensor at a second rate during the second operating mode (normal operation, col. 11. lines 11-14) wherein the second sample rate is higher than the first sample rate (col. 11, lines 66-67).

As to claim 19, Handfield et al. further disclose that the first sensor is a pressure sensor for sensing air pressure inside a tire of a wheel (col. 1, lines 16-37).

As to claim 20, Handfield et al. further disclose that the first sensor is a temperature sensor for sensing temperature inside a tire of a wheel (col. 2, lines 10-14).

As to claim 30, Handfield et al. further disclose that the tire pressure monitoring system further comprises a controller (processor logic array 220, Fig. 7) wherein the piezoelectric sensor and the controller are encapsulated together in a package (Fig. 9C shows components 334 in housing 310).

As to claim 32, Handfield et al. further disclose a motorized vehicle (col. 1 line 16) including the tire pressure monitoring system, the motorized vehicle comprising a wheel including a tire, the tire pressure monitoring system physically coupled to the wheel to monitor air pressure of the tire (Figs. 9B and 9C).

As to claim 33, Handfield et al. further disclose a controller system including a receiver (receiver/user interface 14, Fig. 9A) wherein the tire pressure monitoring system transmits tire pressure information of the tire to the controller system at a first rate in the first operating mode and transmits tire pressure information of the tire to the controller system at a second rate in the second operating mode, wherein the second rate is greater than the first (col. 11, line 10 to col. 12, line 2).

Claims 1-11, 14-27, 30, 32-34, 37 and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by Published U.S. Application No. 2005/0179530 by Stewart et al.

As to claim 1, Stewart et al. disclose a method comprising operating a tire pressure monitoring system (tire monitor system; paragraph 33) in a first operating mode (sleep mode; paragraph 84) using a piezoelectric sensor to sense vibration (piezoelectric motion sensor such as shock sensor 210; Fig. 2 and paragraph 41) determining that an output signal of the piezoelectric sensor is above a predetermined threshold (paragraph 79) and setting the tire pressure monitoring system to a second operating mode based upon the determination that an output signal of the piezoelectric sensor is above a predetermined threshold (normal mode entered after in-motion state determined from shock sensors; paragraphs 87-89).

As to claim 2, Stewart et al. further disclose that during the first operating mode, an output of a first sensor is sampled at a first sample rate and during the second operating mode the output of the first sensor is sampled at a second sample rate (not sampling during sleep mode, and sampling periodically during normal mode; paragraph 84).

As to claim 3, Stewart et al. further disclose that the first sample rate is slower than the second sample rate (paragraph 84).

As to claim 4, Stewart et al. further disclose that the first sensor is a tire pressure sensor (pressure sensor 208; Fig. 2 and paragraph 41).

As to claim 5, Stewart et al. further disclose that the first sensor is a temperature sensor (paragraph 45).

As to claim 6, Stewart et al. further disclose that the piezoelectric sensor senses random vibration caused by a wheel rotating over a surface (paragraph 74).

As to claim 7 Stewart et al. further disclose setting a counter at a first predetermined value, determining that the output signal is below the predetermined threshold during a sampling time, changing the counter value in response to the determining that the output signal is below the predetermined threshold, determining that the counter value is a second predetermined value and setting the tire pressure monitoring system to the first operating mode in response to the determining that the counter value is the second predetermined value (Fig. 12 and paragraphs 98-104 detailing the process for switching modes, e.g. from normal mode to sleep mode).

As to claim 8, Stewart et al. further disclose amplifying the output signal of the piezoelectric sensor (shock sensor interface 306 amplifies the signal; Fig. 3 and paragraph 56)

As to claim 9, Stewart et al. further disclose amplifying the output signal of the piezoelectric sensor intermittingly, wherein the determining is performed when the output signal is being amplified (multiplexing; paragraphs 56 and 59).

As to claim 10, Stewart et al. further disclose that the amplifying is controlled by the assertion of a sample signal (shock sensor interface operates in response to control signals; paragraph 56) from a controller of the tire pressure monitoring system (microprocessor core 302; Fig. 3 and paragraph 56).

As to claim 11, Stewart et al. further disclose that the setting the tire pressure monitoring system to the second operating mode based upon the determination that an output signal of the piezoelectric sensor is above a predetermined threshold further includes determining that the output signal is above the predetermined threshold for at least a second occurrence within a predetermined time before setting the tire pressure monitoring system to the second operating mode (Fig. 12 and paragraphs 98-104 detailing the process for switching modes, e.g. from sleep mode to normal mode).

As to claim 14, Stewart et al. further disclose that the tire pressure monitoring system is implemented in a motorized vehicle (implemented in a vehicle; abstract and vehicle has ignition; paragraph 168).

As to claim 15, Stewart et al. further disclose transmitting information to a controller system of the motorized vehicle at a first rate during the first operating mode (operating circuitry is powered down to conserve energy in sleep mode; paragraph 84) and transmitting information to the controller system at a second rate during the second operating mode (periodic tire characteristic measurement in normal mode; paragraph 84) the second rate being higher than the first rate (periodically measurements of normal mode is higher rate than no measurements of sleep mode).

As to claim 16, Stewart et al. disclose a tire pressure monitoring system comprising a first sensor having an output for providing an indication of a sensed condition of a wheel (pressure sensor 208; Fig. 2 and paragraph 41) a motion detection system (paragraph 46) the motion detection system provides a motion indication indicative of wheel rotation (paragraph 46) the motion indication is utilized for placement of the tire pressure monitoring system in a first

operating mode or a second operating mode (paragraph 84) wherein the motion detection system comprises a piezoelectric sensor for sensing vibration of a wheel rotating over a surface (paragraph 74) indicative of an amplitude of the sensed vibration (paragraph 48) wherein the motion detection system utilizes the output signal in providing the motion indication (paragraph 79).

As to claim 17, Stewart et al. further disclose a controller (microprocessor core 302; Fig. 3) wherein the controller samples an indication of the sensed condition as sensed by the first sensor at a first rate during the first operating mode, wherein the controller samples an indication of the sensed condition as sensed by the first sensor at a second sample rate during the second operating mode, wherein the second sample rate is higher than the first sample rate (not sampling during sleep mode, and sampling periodically during normal mode; paragraph 84).

As to claim 18, Stewart et al. further disclose a controller (microprocessor core 302; Fig. 3) a transmitter operably coupled to the controller (RF circuit 214; Fig. 3) wherein the controller initiates transmitting by the transmitter of information at a first rate during the first operating mode, wherein the controller initiates transmitting by the transmitter of information at a second transmitting rate during the second operating mode and wherein the second sample rate is higher than the first sample rate (not sampling during sleep mode, and sampling periodically during normal mode; paragraph 84).

As to claim 19, Stewart et al. further disclose that the first sensor is a pressure sensor for sensing air pressure inside a tire of a wheel (pressure sensor 208; Fig. 2 and paragraph 41).

As to claim 20, Stewart et al. further disclose that the first sensor is a temperature sensor for sensing temperature inside a tire of a wheel (paragraph 45).

As to claim 21, Stewart et al. further disclose a comparator having an input coupled to the output of the piezoelectric sensor and an output for providing and indication that the output signal of the piezoelectric sensor is greater than a predetermined threshold (paragraph 79 and comparator; Fig. 4) the motion indication is based upon the output of the comparator (paragraph 79).

As to claim 22, Stewart et al. further disclose a controller (microprocessor core 302; Fig. 3) wherein the motion detection system further comprises a counter, the counter being reset to a first predetermined value each time the comparator output indicates that the output signal of the piezoelectric sensor is greater than the predetermined threshold (paragraph 86) the counter counting each time the comparator indicates that the output signal of the piezoelectric sensor is not greater than a predetermined threshold during an assertion of a sample signal from the controller when a count value of the counter is not a second predetermined value (paragraphs 99-101 and Fig. 12) wherein the motion indication is based on the count value of the counter (paragraph 101 and Fig. 12).

As to claim 23, Stewart et al. further disclose a controller (microprocessor core 302; Fig. 3) wherein the motion detection system further comprises a counter, the counter counting each time the comparator indicates that the output signal of the piezoelectric sensor is not greater than the predetermined threshold during an assertion of a sample signal from the controller when a counter value of the counter is not at a predetermined value (paragraph 101 and Fig. 12) wherein the motion indication is at a state indication motion when the counter value is not at the predetermined value (paragraphs 101 and 102 and Fig. 12).

As to claim 24, Stewart et al. further disclose that the motion indication is at a state indicating no motion when the counter value is at the predetermined level (less than 3; Fig. 12).

As to claim 25, Stewart et al. further disclose that the motion detection system further comprises an amplifier having an input coupled to the output of the piezoelectric sensor and an output coupled to the input of the comparator (Fig. 4).

As to claim 26, Stewart et al. further disclose that the motion detection system further comprises an amplifier having an input coupled to the output of the piezoelectric sensor (Fig. 4) the amplifier amplifying the output signal when turned on (circuits turned on; paragraph 84, amplifier amplifying signal; paragraph 59) wherein the controller provides a sample signal (paragraphs 84 and 85) wherein the motion detection system further includes circuitry to turn on the amplifier during an assertion of the sample signal (paragraph 93 and Fig. 11).

As to claim 27, Stewart et al. further disclose that the first operating mode is characterized as being a lower power operating mode than the second operating mode (paragraph 84).

As to claim 30, Stewart et al. further disclose a controller (microprocessor core 302; Fig. 3) wherein the piezoelectric sensor and the controller are encapsulated together in a package (Fig. 1).

As to claim 32, Stewart et al. further disclose a motorized vehicle including the tire pressure monitoring system (implemented in a vehicle; abstract and vehicle has ignition; paragraph 168) the motored vehicle comprising a wheel including a tire (paragraph 33) the tire pressure monitoring system physically coupled to the wheel to monitor air pressure of the tire (paragraph 35).

As to claim 33, Stewart et al. further disclose that the tire pressure monitoring system transmits tire pressure information of the tire to the controller system at a first rate in the first operating mode and transmits tire pressure information of the tire to the controller system at a second rate in the second operating mode wherein the second rate is greater than the first (paragraph 84).

As to claim 34, Stewart et al. further disclose that the motion detection system comprises a counter (paragraph 100) the counter preventing the tire pressure monitoring system from operating in the second mode until after at least two samples of the output signal from the piezoelectric sensor are above a predetermined threshold (paragraphs 98-105 and Fig. 12).

As to claim 37, Stewart et al. further disclose a controller (microprocessor core 302; Fig. 3) wherein at least some of the operations of the motion detection system are performed by the controller (paragraph 87).

As to claim 38, Stewart et al. disclose a tire pressure monitoring system comprising a pressure sensor having an output for providing an indication of the sensed pressure at a first sample rate during a first operating mode and for sampling an indication of the sensed pressure at a second sample rate during a second operating mode, the second sample rate being greater than the first sample rate (paragraph 84) and a motion detection circuit comprising a piezoelectric sensor for sensing vibration of a wheel rotating over a surface (paragraph 74) the piezoelectric sensor having an output to provide an output signal indicative of an amplitude of the sensed vibration (paragraph 48) an amplifier having an input coupled to the output of the piezoelectric sensor and an output (Fig. 4) a comparator having an input coupled to the output of the amplifier (Fig. 4) the output of the comparator providing an indication that the output signal of the

piezoelectric sensor is greater than a predetermined threshold (paragraph 79 and comparator; Fig. 4) wherein the operating mode of the tire pressure monitoring system is based upon the comparator output (paragraph 79).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 12, 13, 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Published U.S. Application No. 2005/0179530 by Stewart et al., as applied to claims 1 and 16 above, in view of U.S. Pat. No. 4,991,439 to Betts.

As to claim 12, Stewart et al. fail to disclose that the piezoelectric sensor is encapsulated in an encapsulant that includes one of a thermo-plastic material or a thermo set material.

Betts discloses a piezoelectric sensor encapsulated in an encapsulant that includes a thermo-plastic material or a thermo set material (col. 6, lines 47-52).

It would have been obvious to one of ordinary skill in the art to modify the tire pressure monitoring system of Stewart et al. by including the hard plastic encapsulant of Betts in order to enhance the sensitivity of the piezoelectric sensor to minor stress forces (Betts; col. 7, lines 46-55).

As to claim 13, Betts further discloses that the encapsulant functions to amplify the vibration sensed by the piezoelectric sensor (col. 6, lines 46-51).

As to claim 28, Stewart et al. further disclose that the piezoelectric sensor is made of a piezoelectric material having a first Young's Modulus (inherent in disclosed piezoelectric vibration sensors). Stewart et al. fail, however, to disclose that the piezoelectric sensor is encapsulated in an encapsulant having a second Young's Modulus that is more elastic than the first Young's Modulus.

Betts discloses a piezoelectric sensor encapsulated in an encapsulant (col. 6, lines 47-52) having a second Young's Modulus (inherent) that is more elastic than the first Young's Modulus (the piezoelectric ceramic of the piezoelectric vibration sensor of Stewart et al. is inherently less elastic than the plastic disclosed in Betts).

It would have been obvious to one of ordinary skill in the art to modify the tire pressure monitoring system of Stewart et al. by including the hard plastic encapsulant of Betts in order to enhance the sensitivity of the piezoelectric sensor to minor stress forces (Betts; col. 7, lines 46-55).

As to claim 29, Betts further discloses that the encapsulant functions to amplify the vibration sensed by the piezoelectric sensor (col. 6, lines 46-51).

Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Published U.S. Application No. 2005/0179530 by Stewart et al., as applied to claims 16 and 30 above, in view of U.S. Pat. No. 6,891,239 to Anderson et al.

Stewart et al. fail to disclose a lead frame having a first side and a second side, the piezoelectric sensor being mounted on the first side and the controller being implemented in an integrated circuit die mounted on the second side, wherein at least a portion of the lead frame is encapsulated with the piezoelectric sensor and the controller.

Anderson et al. disclose a lead frame having a first side and a second side (package substrate 52 and solder ball connections 60; Fig. 3 and col. 5 lines 17-33) a MEMs sensor being mounted on the first side (col. 5, lines 17-22) and a controller implemented in an integrated circuit die mounted on the second side (14, 18, 20 and 22; Fig. 3 and col. 5, lines 29-34) wherein at least a portion of the lead frame is encapsulated with the MEMs sensor and the controller (potting 100 and silicone rubber 120; Fig. 4; col. 6, lines 19-30).

It would have been obvious to one of ordinary skill in the art to modify the tire pressure monitoring system of Stewart et al. by mounting the piezoelectric sensor and controller on opposite sides of a package substrate as taught by Anderson et al. in order to reduce the size of the sensor and controller package, increase performance by reducing signal path length and thereby reduce parasitic capacitance and noise and reduce the number of electrical interconnections in the device (Anderson et al. col.1, lines 47-60 and col. 5, lines 60-67).

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Published U.S. Application No. 2005/0179530 by Stewart et al. as applied to claim 16, in view of U.S. pat. No. 3,185,869 to Shoor.

Stewart et al. fail to explicitly disclose a capacitive element coupled in series to the output of the piezoelectric sensor for increasing a sensitivity of the output signal of the piezoelectric sensor.

Shoor discloses a capacitive element (capacitor 50'; Fig. 5) coupled in series to the output of a piezoelectric element (X; Fig. 5) for increasing a sensitivity of the output signal of the piezoelectric element (col. 4, lines 63-71).

It would have been obvious to one of ordinary skill in the art to modify the tire pressure monitoring system of Stewart et al. by including the capacitor of Shoor, in series with the piezoelectric sensor in order to increase the sensitivity of the output of the sensor as taught by Shoor.

Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Published U.S. Application No. 2005/0179530 by Stewart et al. as applied to claim 16, in view of U.S. pat. No. 5,178,016 to Dauenhauer et al.

Stewart et al. fail to disclose a shunt resistive element coupled in parallel to the output of the piezoelectric sensor for decreasing a sensitivity of the output signal of the piezoelectric sensor.

Dauenhauer et al. disclose a shunt resistive element (load resistor 106; Fig. 7) coupled in parallel to the output of a piezoelectric sensor (shear element 88; Fig. 7) for decreasing a sensitivity of the output signal of the piezoelectric sensor (col. 4 lines 56-68).

It would have been obvious to one of ordinary skill in the art to modify the tire pressure monitoring system of Stewart et al. by including the resistor of Dauenhauer, in parallel with the piezoelectric sensor in order to decrease the sensitivity of the output or the sensor as taught by Dauenhauer.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Published U.S. Application Nos. 2002/0075144; 2004/0020291 and 2004/0083817 disclose various sensors and methods of sensing and mounting sensors.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George P. Bonanto whose telephone number is (571) 272-2182. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David M. Gray can be reached on (571) 272-2119. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Gray
Primary Examiner

GPB